

Intelligent Platform Management Futures :

IPMI, CIM, and Emerging
Management Technologies

Tom Slaight

Principal Server Management Architect

Agenda

- **Architecture and Initiative Update**
- **IPMI in Action**
- **Platform Management Futures**

IPMI

Intelligent Platform Management Interface

- Defines a standardized, abstracted, message-based interface to intelligent platform management hardware
- Defines standardized records for describing platform management devices and their characteristics

Promoters:



Adopters: 178 and growing

IPMI Initiative News

New v2.0 / v1.5 Errata, latest 32- and 64-bit Drivers, IPMI Conformance Test Suite & Command Tool updates

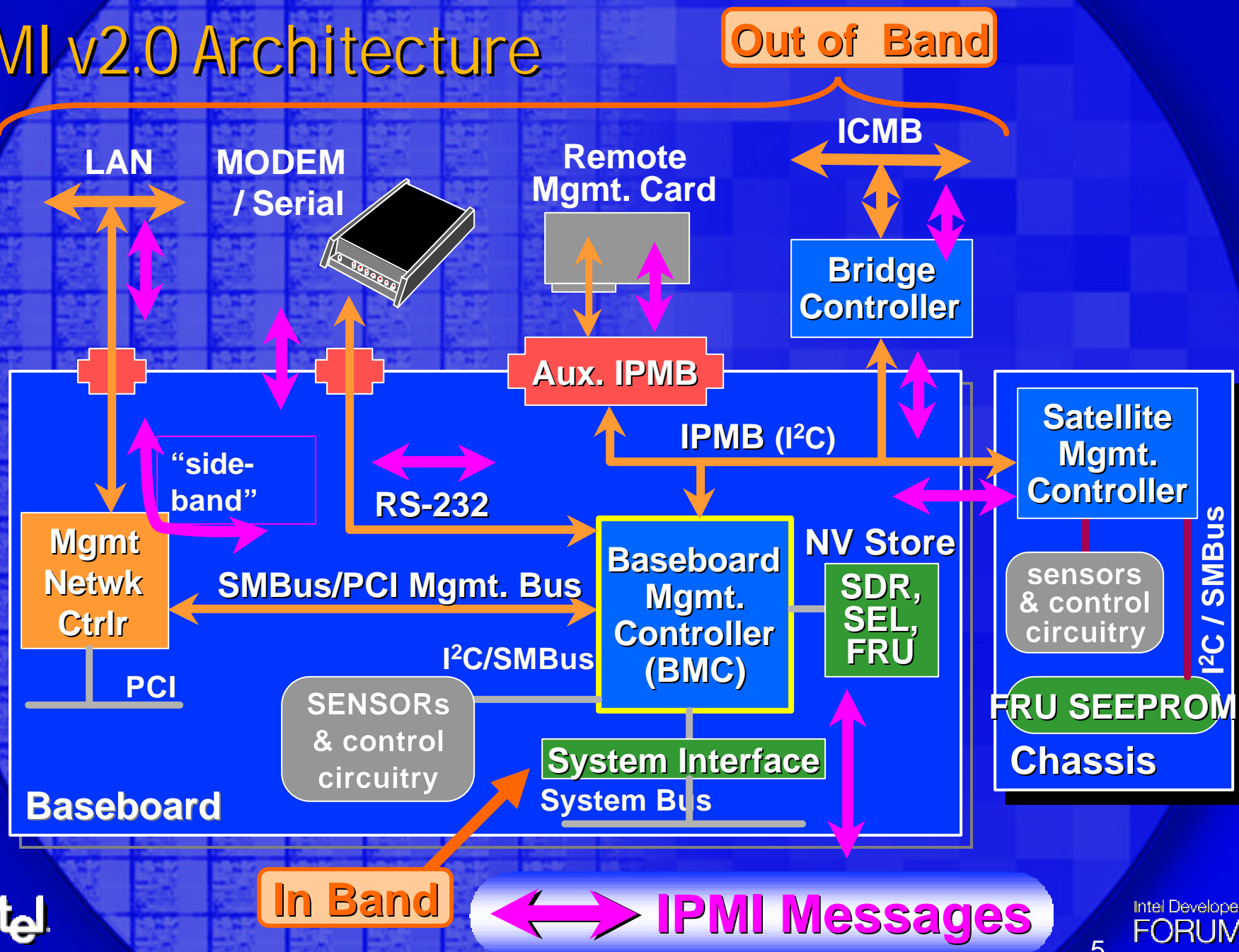


www.intel.com/design/servers/ipmi

Intel Developer
FORUM

Architecture and Initiative Update

IPMI v2.0 Architecture

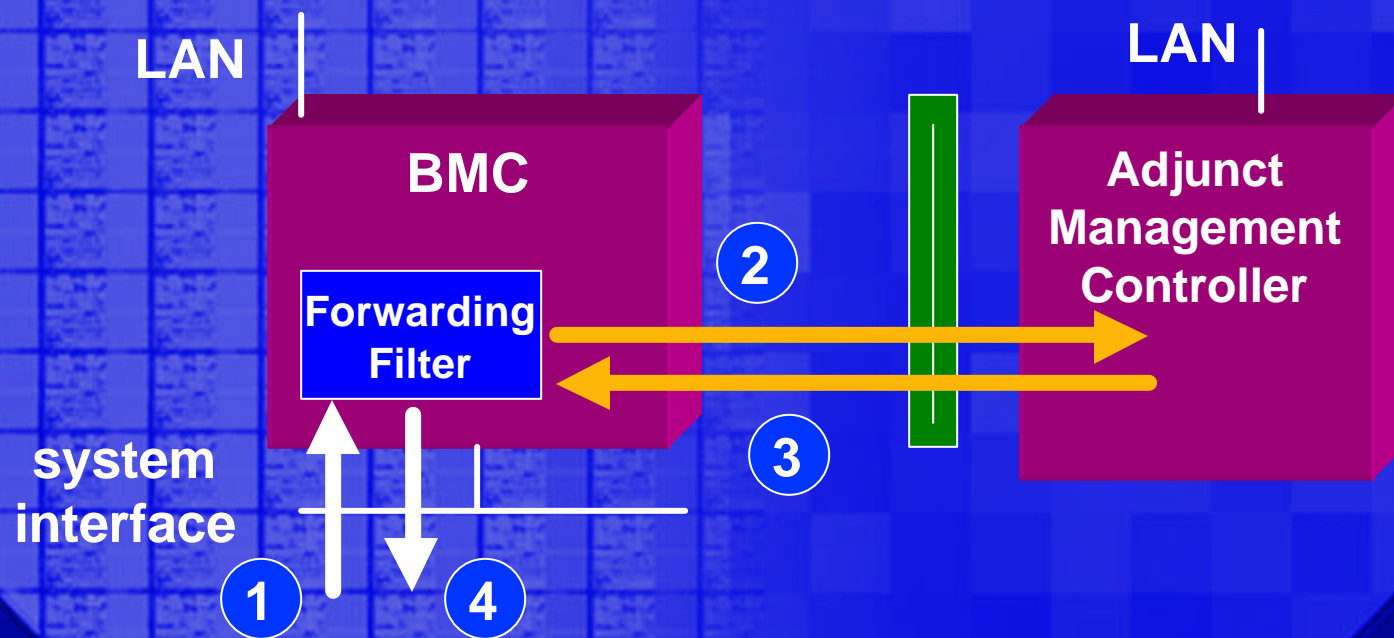


Recent IPMI Specification Addenda

- **RMCP+ Clarifications**
 - Additional clarifications to RMCP+ protocol operation
- **New *Set Sensor Reading* command**
 - supports software-driven sensor data
- **Chassis Identify capability discovery**
 - enables software discovery of Chassis Identify feature
- **Command Forwarding**
 - Supports add-in card applications of IPMI
 - Enables BMC to forward IPMI commands to an auxiliary controller for processing

Command Forwarding

- 0 Add-in configures and enables Forwarding Filter
- 1 BMC receives request over specified interface
- 2 BMC forwards request encapsulated in *Forwarded Command* request message
- 3 Add-in processes request, and returns response in *Forwarded Command* response message
- 4 BMC extracts response and delivers it to original requester



Recent IPMI Specification Addenda

- **Sensor/Event Extensions**
 - **Memory sensor:**
 - new offset for 'Automatic Throttling'
 - **Drive Slot (bay) sensor:**
 - new offsets to cover SAF-TE/SES drive slot status for RAID status support
 - **Cable / Interconnect sensor:**
 - new offsets for cable connected and mis-connected (mis-configured) status

Agenda

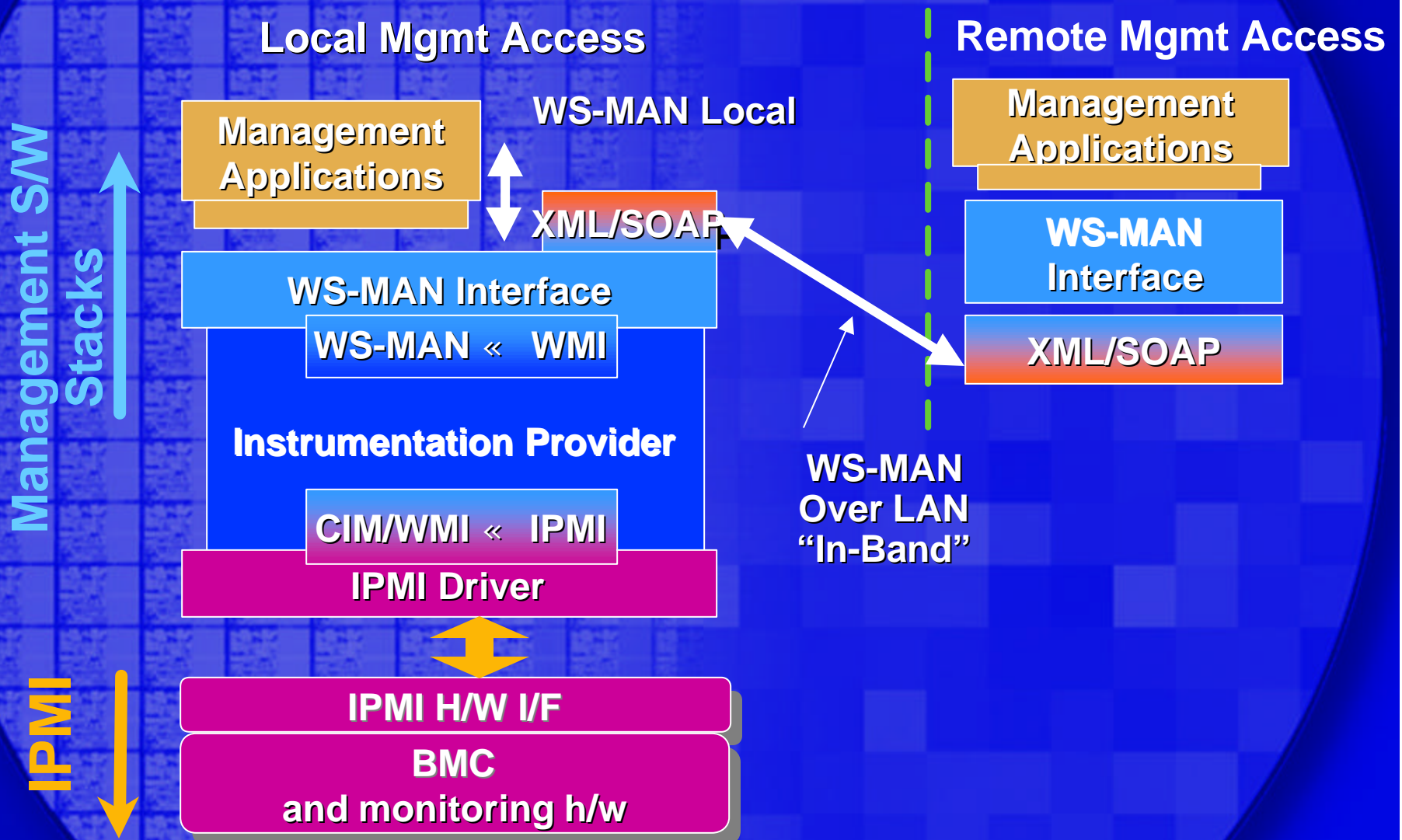
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IPMI and Intel® AMT

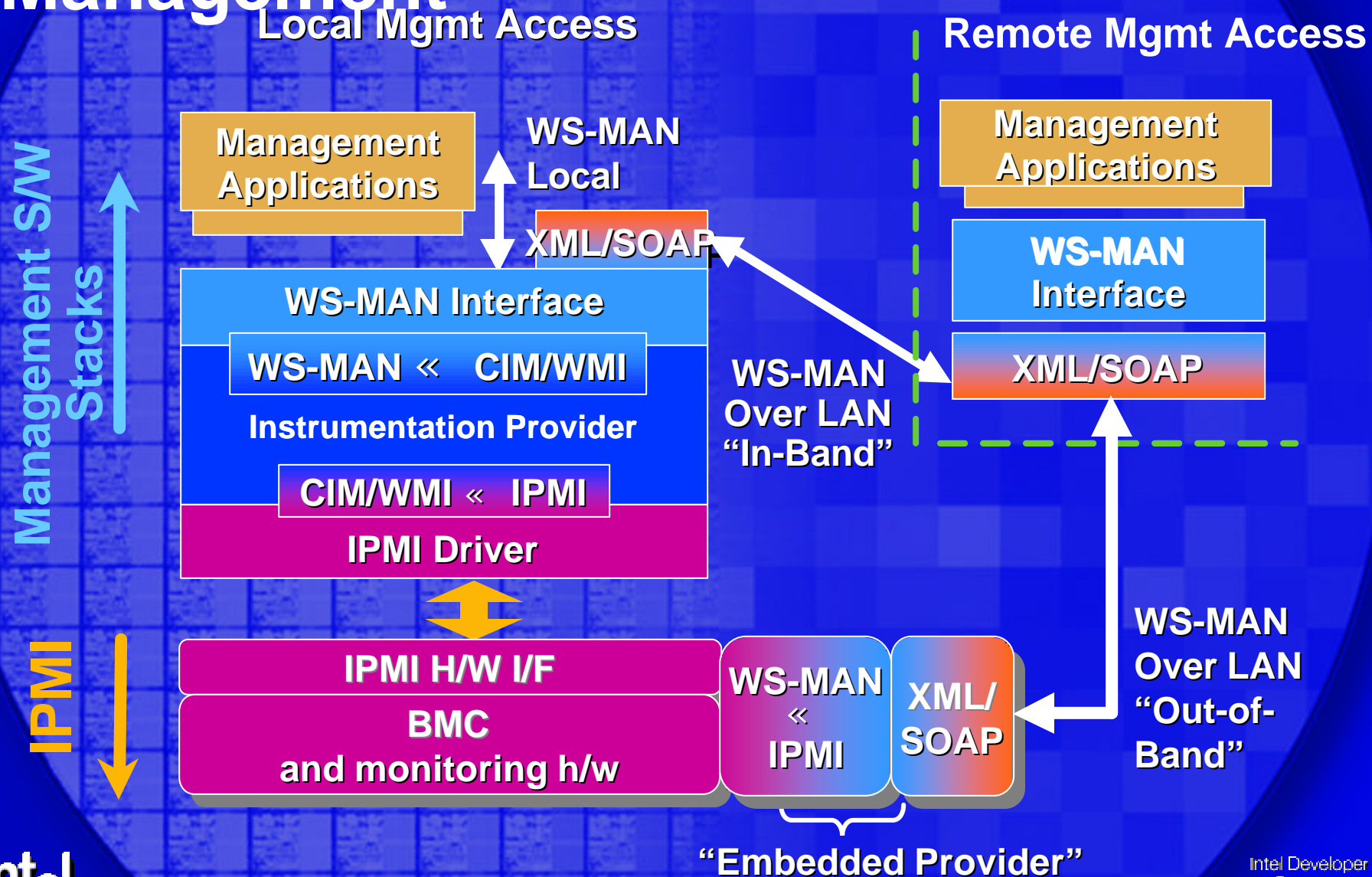
- **Intel® AMT: a management *architecture* with consistent cross-platform capabilities, interfaces and protocols**
 - Implemented in PCs in mid-'05, in notebooks and 2p servers in '06, in larger servers and other platforms in '07
 - In servers, Intel AMT interface will employ IPMI and WS-MAN
 - Includes additional embedded capabilities, beyond IPMI
- **IPMI: a server-based management *interface***
 - First implemented in 1998; now at rev 2.0
 - Supported by 178 vendors, including DELL, HP, IBM, NEC...

For more on Intel AMT, visit www.intel.com/go/manage
For more on IPMI, visit www.intel.com/design/servers/ipmi

Local Management via IPMI & CIM

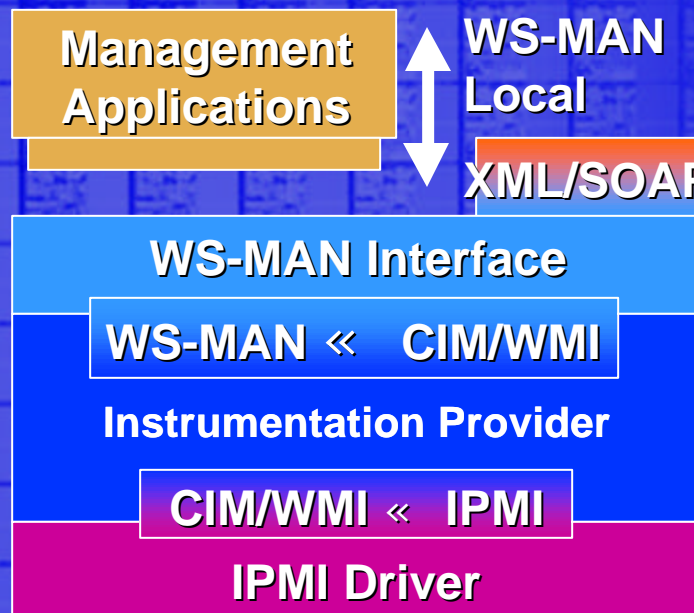


Common Local and Remote Management



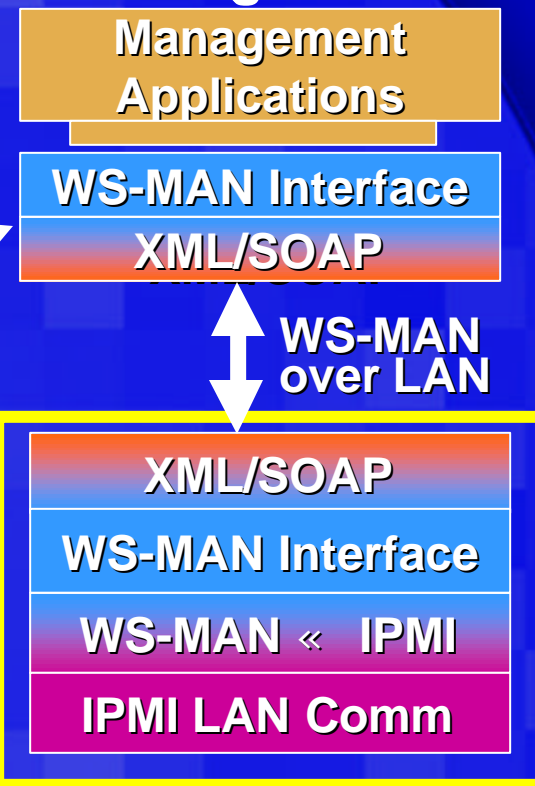
Proxy for Migration

Management S/W
Stacks



IPMI over LAN

Remote Mgmt Access



Proxy System

WS-MAN Over LAN "In-Band"

IPMI over LAN "Out-of-Band"

IPMI to CIM Mapping Guideline

- From HP, Dell, and Intel
- Facilitates consistent CIM use of IPMI-based systems
- Defines how to use IPMI for populating CIM management objects
 - Covers capabilities that can be accessed via standard IPMI commands
- Aligns with DMTF SMWG (SMASH) Profiles
- Encourages CIM use
 - No CIM-based 'back door' for alternative access to CIM-defined functions

IPMI to CIM Mapping Guidelines

- **Supports OEM Valued-added Capability Access via CIM**
 - OEM SDRs
 - OEM Event Record Information
 - OEM Commands

Mapping Specification Functionality

Functionality/Stage	Guideline Version	Target Date
Sensors, SEL Log, Health, Status and State	0.40	✓ January 17, 2005 (posted 1/24/05)
PowerControl, UserID, SoftwareID, Versioning, MAP, Base System	0.50	February 14, 2005
Physical Device Info – FRU Data, Redundancy, WatchDog	0.60	March 14, 2005
Indications	0.70	April 18, 2005
Pet Alert, PEF Filter, RMCP Services (SOL, IPMI Binary) Raw SDR Info	0.80	May 16, 2005
Final Review	0.90	June 1, 2005
Target Deadline	1.0	June 30, 2005

- = Generic CIM capability
■ = IPMI Specific

Mapping Process

- **IPMI Enumeration**
 - Guideline describes process and rules for using IPMI SDRs and commands to enumerate the sensors, managed entities, and FRU data provided by system
- **CIM Object & Association Instantiation**
 - Describes how to take enumerated IPMI capabilities and use that information to instantiate CIM objects that support them
 - Also describes how to use IPMI Sensor-to-Entity and Entity Association information to populate CIM associations

Mapping Process

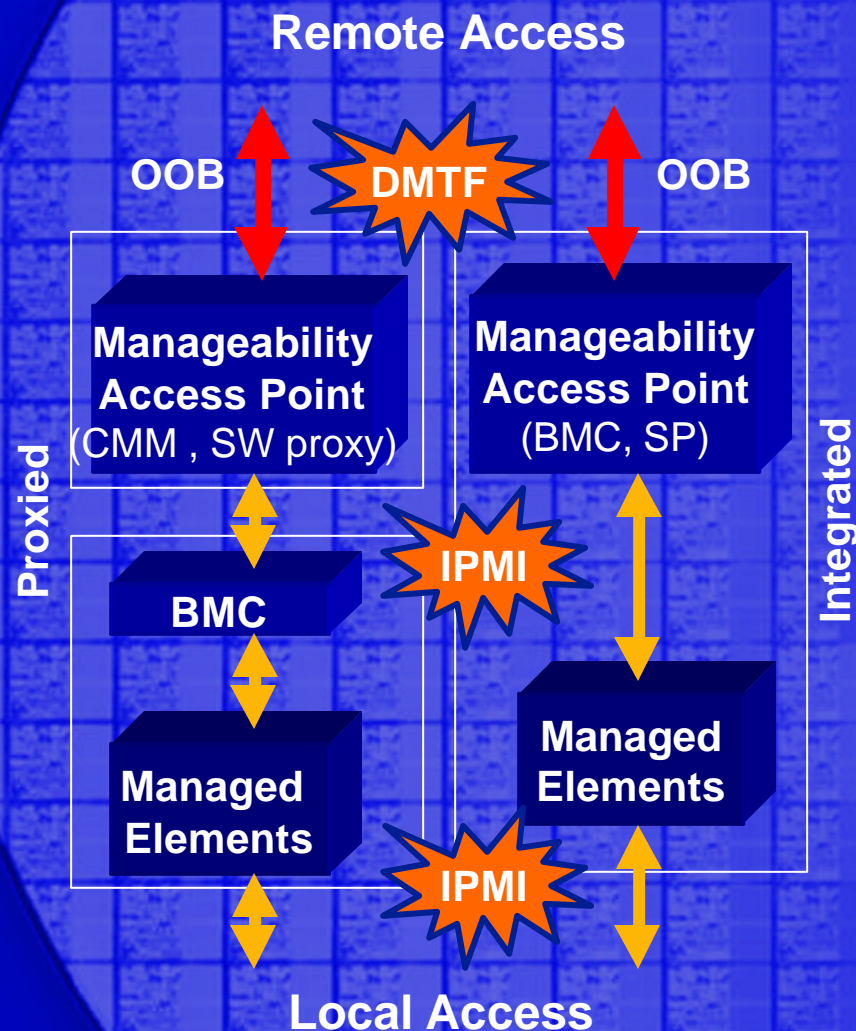
- **CIM Object behavior with IPMI**
 - Describes which object attributes should be implemented, and how IPMI is used to populate/support those attributes
- **Event Handling**
 - How IPMI event log information is mapped into CIM Event Logs
 - How OEM event data is supported
- **OEM Access**
 - How OEM command and Sensor Data Record capabilities can be accessed via CIM

**IPMI technology simplifies supporting
CIM platform manageability**

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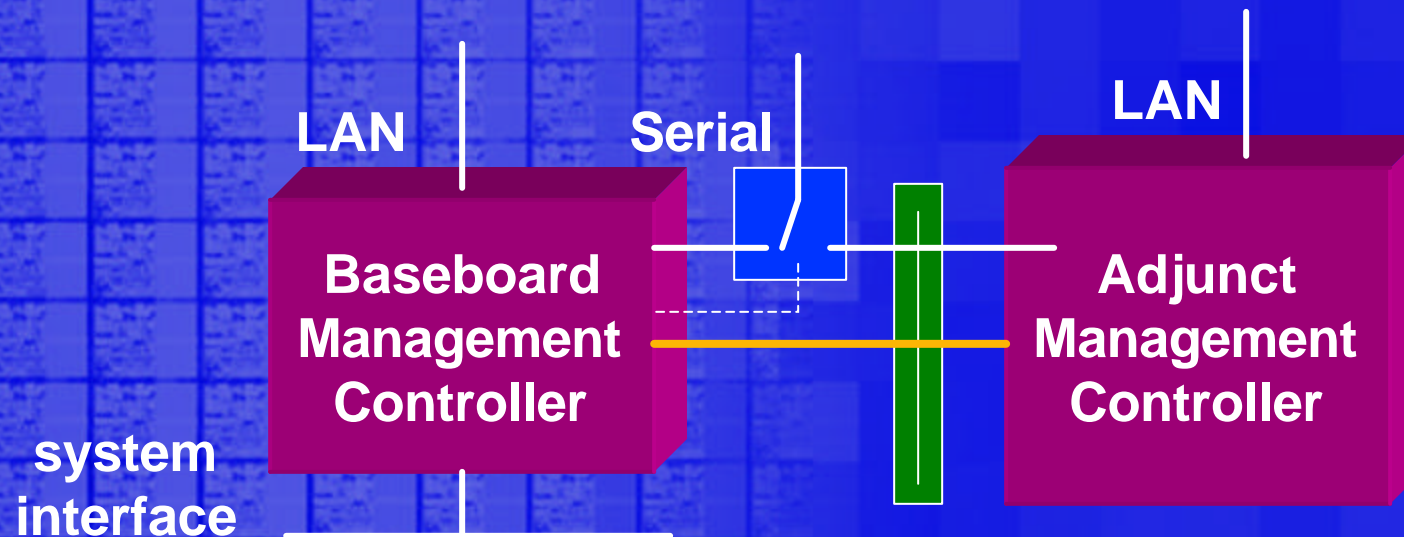
Convergence on Platform Interfaces



- DMTF striving for common cross-platform OOB management interface
 - Web-services -based structured protocol
 - CLI for human access, scriptable
 - CIM Schema, profiles for compliance
- IPMI continues to be
 - Infrastructure for implementation under DMTF interfaces
 - ‘Inside-the-Box’ interface, e.g.
 - Between BMC and system components
 - Between CMM and blades
 - Alternative OOB interface when Manageability Access Point is a SW Proxy
 - For ‘low-end’ implementations
 - For migration and support of installed base

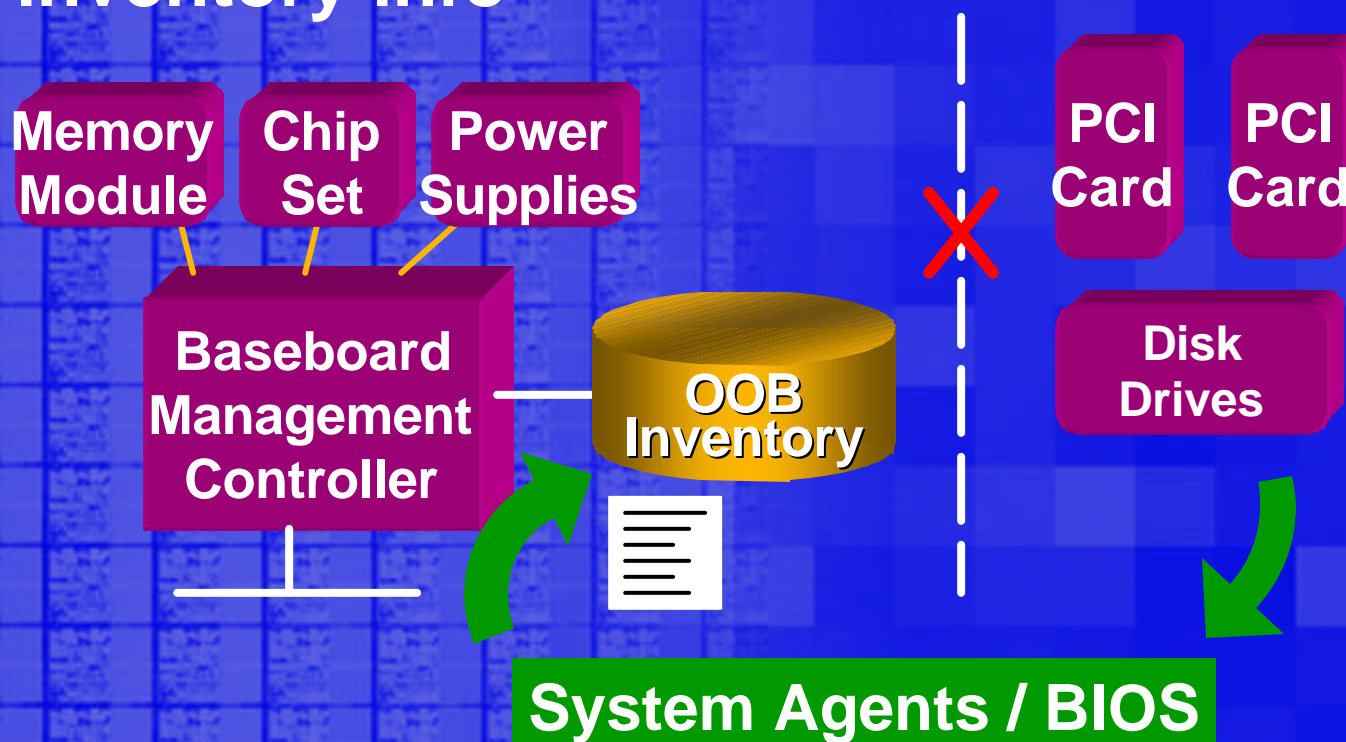
New Directions - Management Add-in

- Provides common interfaces for extending basic management functionality
- Command forwarding, connectivity routing and control
 - enable add-in to transparently process and extend IPMI functionality



New Directions - Command Forwarding

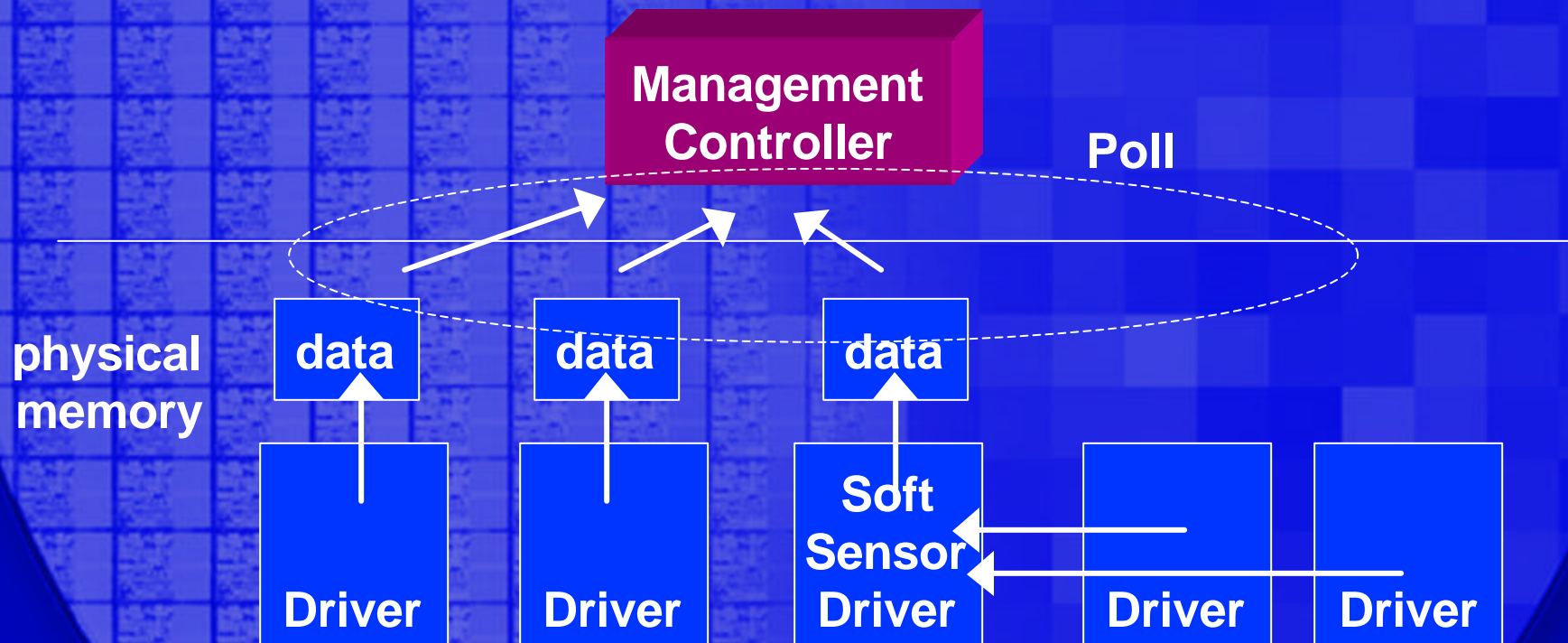
- BMC has limits on access to hardware inventory info



- Common interfaces and formats enable richer OOB inventory reporting

New Directions - Soft Sensors

- Links vendor-specific h/w info (e.g. temperature) into autonomous h/w monitoring and event handling policies of the management controller
- Provides Post-mortem status of hardware events



New Directions - Security Options

- **Site Security demands increasing**
 - Mutual Authentication and 'chain of trust'
 - WAN and Wireless access
- **Simple needs remain**
 - "Single Server" Sites in Small/Medium Business and remote locations
 - Low cost management hardware w/o security acceleration
- **Security Options must address the needs of the Site and User**
 - Simple passwords through full certificates

**IPMI and DMTF platform management technologies
will evolve with valuable new capabilities**

Summary

- **IPMI provides the foundation for cross-platform management**
- **IPMI technology reduces effort for supporting CIM platform manageability**
- **Intel® Active Management Technology along with IPMI and DMTF Technologies will evolve with valuable new capabilities**

Intelligent Platform Management Futures

Tom Slaight, Intel Corporation



Questions?

More on IPMI at IDF:

- **Technology Showcase**
See demos of IPMI-based systems
in the Intel Pavilion

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